

Editorial

‘The Benchmark Problem’

The First World Conference on Structural Control (1WCSC) took place at the Ritz–Carlton Huntington Hotel Los Angeles, California USA 3–5 August 1994. The Conference was organized by the *U.S. Panel on Structural Control Research* and the *Japan Panel on Structural Response Control* under the sponsorship of the *International Association for Structural Control* (IASC). There were over 400 participants showing that *Structural Control* is a subject of wide interest internationally. The papers presented at the conference were published in a three-volume proceedings by the IASC under the editorship of G. W. Housner, S. F. Masri and A. G. Chassiakos.

In discussions at the conference two important problems emerged, the first problem recognized that structural engineers and control engineers do not speak the same language, which can lead to serious misunderstandings. The second problem recognized that it was not possible, in general, to compare different control strategies directly because the controls were applied to different structures.

The first problem was addressed in an extensive tutorial paper *‘Structural Control Past, Present and Future’* which was published in a special issue of ASCE Journal of Engineering Mechanics, pages 895–971, September 1997, Vol 123 No 9.

The second problem had been addressed by NASA in their space structures programme, the solution they adopted was to build a test bed structure and a number of sensors and actuators. Various control strategies could then be implemented and objective comparisons made. Clearly the IASC lacked the funds to duplicate the NASA physical test bed approach, so it was suggested that the ‘Test Bed’ be implemented in software. Where the software contained an accurate description of a multi-story structure together with the dynamics of sensors and actuators. In this we were very fortunate to find that Professor Spencer and his colleagues at the University of Notre Dame had such a carefully researched software test bed. By applying different control strategies to the ‘Test Bed’ and measuring the response to a standardized ‘Earthquake’ direct comparison of the effectiveness of the control strategies could be made. Professor Spencer and his colleagues generously made their software test bed available and solicited others to implement their favorite control strategy on the ‘Test Bed’. All papers were subjected to rigorous reviews and the surviving papers appear in *‘The Benchmark Problem’*, a special issue of the *Journal*.

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